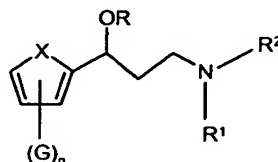


ABSTRACT
PROCESSES FOR THE PREPARATION OF HETEROCYCLIC HYDROXYAMINES, AND
INTERMEDIATES AND CATALYSTS FOR USE THEREIN

5 A process for the preparation of a compound of Formula (1):

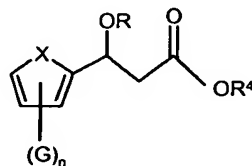


Formula (1)

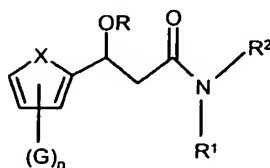
10 wherein: X is S, O or NR³, wherein R³ is H or an organic group; R is H or an organic group; R¹ and R² each independently are H, optionally substituted alkyl or optionally substituted aryl; G is a substituent; and n is 0 to 3:

which comprises the steps:

15 (a) reacting a compound of Formula (2) with a compound of Formula NHR¹R² to give a compound of Formula (3):



Formula (2)

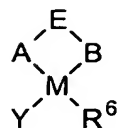


Formula (3)

20 wherein X, R, G and n are as defined above and R⁴ is optionally substituted alkyl, optionally substituted alkenyl, optionally substituted alkynyl, optionally substituted aryl, 25 optionally substituted heteroaryl or a combination thereof; and

(b) reducing the compound of Formula (3) to give a compound of Formula (1) is provided.

Processes for the preparation of a compounds of Formula (2), novel compounds of 30 Formula (3) and certain preferred catalysts of formula:



wherein: R⁶ represents a neutral optionally substituted hydrocarbyl, a neutral optionally substituted perhalogenated hydrocarbyl, or an optionally substituted cyclopentadienyl ligand; A represents an optionally substituted nitrogen; B represents an optionally substituted nitrogen, oxygen, sulphur or phosphorous; E represents a linking group; M represents a metal capable of catalysing transfer hydrogenation; and Y represents an anionic group, a basic ligand or a vacant site; provided that at least one of A or B comprises a substituted nitrogen and the substituent has at least one chiral centre; and provided that when Y is not a vacant site that at least one of A or B carries a hydrogen atom, are also provided.